



INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 9325	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB 03/01592	International filing date (day/month/year) 09.04.2003	Priority date (day/month/year) 20.05.2002
International Patent Classification (IPC) or both national classification and IPC C07C51/12		
Applicant BP CHEMICALS LIMITED		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.  
  
☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
  
These annexes consist of a total of 1 sheets.

## 3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  25.11.2003	Date of completion of this report  28.06.2004
Name and mailing address of the International preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Lorenzo Varela, M.J.  Telephone No. +49 89 2399-8239  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/GB 03/01592**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

2-17 as originally filed  
1 filed with telefax on 06.05.2004

**Claims, Numbers**

1-30 as originally filed

**Drawings, Sheets**

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-30
Inventive step (IS)	Yes: Claims	
	No: Claims	1-30
Industrial applicability (IA)	Yes: Claims	1-30
	No: Claims	

2. Citations and explanations  
**see separate sheet**

**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

D1: EP-A-0849250

D2: EP-A-0846674

D3: FR-A-2795410

D4: US-A-5770768

D5: US-A-5237097

1. The present application relates to a process for the production of acetic acid by carbonylation of methanol and/or a reactive derivative thereof in a liquid reaction composition comprising iridium carbonylation catalyst, ruthenium promoter, methyl iodide co-catalyst, methyl acetate, acetic acid and water wherein the amount of carbon monoxide in contact with the promoter is maintained above a certain level in order to reduce the losses of promoter and/or catalyst.

**Novelty**

2. The subject-matter of claims 1-30 is not novel in the sense of Art. 33(2) PCT. Documents D1 and D2 disclose processes for the production of acetic acid by carbonylation of methanol and/or a reactive derivative thereof in a liquid reaction composition comprising iridium carbonylation catalyst, ruthenium promoter, methyl iodide co-catalyst, methyl acetate, acetic acid and water wherein the amount of carbon monoxide in contact with the promoter is maintained above a certain level in order to reduce the losses of promoter and/or catalyst (see the passages mentioned in the search report). The formula  $y > mX + C$  is not mentioned in these documents but in view of the operation conditions employed, the amount of carbon monoxide expressed by this formula is met in both disclosures.
3. The applicant argues that both documents are silent about maintaining the carbon monoxide concentration in the low-pressure off-gas at a defined amount but in view of the examples in the present application wherein maintaining the carbon monoxide concentration in the low-pressure off-gas means in fact maintaining the concentration in the reactor and taking into account that according to the examples in both documents the carbon monoxide is maintained within the levels expressed by the

above-mentioned formula, novelty cannot be acknowledged.

**Further comments**

4. Experiments 27-33 in the application maintain the carbon monoxide concentration within the levels expressed by the formula in claim 1. However, solid formation takes place. The fact of carrying out the invention according to the technical features included in the claims and not solving the problem posed, leads to lack of clarity about the scope of the protection sought, contrary to Art. 6 PCT.
5. The terms "a reactive derivative thereof" used in claim 1 render the scope of the protection unclear, contrary to Art. 6 PCT. The definition of these terms on page 5, line 12, " methyl acetate, dimethyl ether and methyl iodide" should have been included in the claim.
6. The use of the word "about", especially in connection with numerical ranges, is generally regarded as rendering the determination of the exact scope of the range difficult. When used in a claim as well as in the description, this results in lack of clarity, contrary to Art. 6 PCT. Therefore, claims 1 and 30 as well as the description should not have included this word.
7. The term "substantially" used in claim 3 as well as in the description does not have a generally accepted meaning in the art, rendering therefore unclear the scope of the protection sought, contrary to Art. 6 PCT. This term should not have been used.
8. The terms "essentially" and "approximately" used in the description do not have a generally accepted meaning in the art, rendering therefore unclear the scope of the protection sought, contrary to Art. 6 PCT. This term should not have been used.

### PROCESS FOR THE PRODUCTION OF ACETIC ACID

The present invention relates to a process for the production of acetic acid by the carbonylation of methanol and in particular to a process for the production of acetic acid by the carbonylation of methanol in the presence of an iridium carbonylation catalyst and a ruthenium promoter.

- 5        The production of acetic acid by the carbonylation of methanol in the presence of an iridium catalyst and ruthenium promoter is described for example in US 5672743, EP-A-0752406, EP-A-0849248, EP-A-0849249, EP-A-0849250, EP-A-0999198 and EP-A-1002785. In such liquid phase carbonylation processes, the acetic acid product may be recovered by withdrawing the liquid carbonylation composition from the
- 10   carbonylation reactor subjecting the composition to one or more separation stages to recover the acetic acid product and returning other components of the composition to the carbonylation reactor.

- The stability of the iridium carbonylation catalyst during the product recovery stage has been the subject of several patent applications such as for example WO 96/14286
- 15   and EP-A-0616997.

- US 5,237,097 relates to a carbonylation process in which the liquid carbonylation product solution is conveyed to a separation zone maintained at a lower total pressure than is the pressure in the reaction zone and simultaneously, there is introduced a carbon monoxide-containing gas contributing a partial pressure of up to 30 psia of the total
- 20   pressure in the separation zone. The Group VIII metal-containing catalyst is said to be preferably rhodium, ruthenium, palladium, cobalt and nickel, of which rhodium, cobalt and nickel are said to be particularly preferred and only rhodium is illustrated by example and is the subject of the claims.